Designing Mobile Interactions for the Ageing Populations

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Abstract
We are concurrently witnessing two significant shifts: mobiles are becoming the most used computing device; and older people are becoming the largest demographic group. However, despite the recent increase in related CHI publication, older adults continue to be underrepresented in HCI research as well as commercially, further widening the digital divide they face and hampering their social participation. This workshop aims to increase the momentum for such research within CHI and related fields such as gerontechnology. We plan to create a space for discussing and sharing principles and strategies to design and evaluate mobile user interfaces for the aging population. We thus welcome contributions to empirical studies, theories, design and evaluation of mobile interfaces for older adults.

Author Keywords
Older adults, mobile interface design, cognitive science, empirical studies, accessibility, gerontology, gerontechnology

ACM Classification Keywords
H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous

Introduction
Both developed and developing nations are experiencing rapid ageing of their populations: over 65

years old are expected to comprise 27% and 15% of these nations' population, respectively, by 2050 [4, 6]. Although issues related to older adults are receiving substantial attention in other areas of research e.g., Gerontology, Accessibility, Cognitive Psychology, the HCI community might contribute more.

Ageing is associated with a multitude of biological, cognitive, and social changes that impact the use of technology [5]. In particular, in case of mobile devices, these can seriously hamper usability. However, age also brings new opportunities, which well-designed mobile apps could support, such as increased spare time, strengthened family connections, and new learning and travel opportunities.

The digital revolution has not adequately considered the needs of the ageing populations. Although older adults constitute an increasing segment of the demographics, the majority of research on HCI, as well as industrial companies, focuses almost exclusively on younger adults. As a result, even though smartphone ownership among older adults has significantly increased in recent years [2,3,12], smartphone adoption level for is still low (e.g., smartphone ownership in the US is at 27% for older adults as of 2015, whereas 85% of young people aged 18-29 are smartphone owners [13]). Consequently, older adults may be losing the possible benefits and opportunities from this growing digital era [1,5,7].

The main goal of this workshop is to discuss suitable design and evaluation strategies of Mobile UIs as well as to coordinate efforts and raise awareness of HCI as it affects older adults and to rethink designing and evaluating mobile interfaces for this community.

Workshop Goals

CHI is one of the most multidisciplinary research communities. In recent years it has made tremendous progress in supporting many marginalized user groups (e.g. low literacy, developing countries, accessibility) or in addressing critical societal needs (e.g. sustainability, inclusion). These have been enabled by advancement in research and design, such as new interaction paradigms or novel devices. We believe it is now timely to more systemically investigate how, as a community, we can leverage such advances and better support the safety, health, social, or digital inclusion needs of older adults. While recent years have seen an increase in such research activity at CHI, it has mostly materialized in the form of isolated publications. Yet there is increasingly strong evidence that HCI researchers are increasingly interested in this topic. This is exemplified by the very large attendance (more than 50 participants) to our first Special Interest Group (SIG) on Older Adults, at CHI 2016 [10], or by the numerous submissions received by recent workshops such as Re-imagining commonly used mobile interfaces for older adults in MobileHCI 2014 [15], and 2nd Workshop on Designing with Older Adults: Towards a Complete Methodology in MobileHCI 2015 [16] or the first-ever international symposium on Interactive Technology and Ageing Populations [17], held in October 2016. All these recent events were co-organized by the proponents of this workshop submission.
Capitalizing on this recent increase in interest, this workshop aims to reach three goals as follows:

Building a Research Repository
Presently researchers working on this topic are scattered across different fields. The research outcomes, experiences, and practices are not

disseminated across the boundaries of these fields. Thus, a major goal of this workshop is to bring researchers from these fields together to synthesize and collate findings from different disciplines, and create opportunities to explore bridging between several field experts in order to develop efficient, effective, usable, and adoptive mobile technologies and more appropriate methods.

Community Building
Senior-centred research and development is currently conducted in academic and industry research labs in a rather disjoint manner. As such, this workshop's goal is to link the SIGCHI community with researchers and practitioners across academic disciplines (such as the Gerontology, Cognitive Science, Psychology, Cognitive Neuroscience) and industries who are actively working or having interest toward understanding older adults' technology use, specifically mobile applications. For future collaborations, mailing lists and post-CHI activities (e.g., a symposia/summer school) will be established.

Raising Awareness
Interactive technologies for seniors is a significant market of interest for industries, expected to grow from US$ 2 billion to an estimated US$ 30 billion in the next few years [8]. This is a natural reflection of the size of this user group (16% of population [9]). Yet interest in HCI is still relatively small (less than 1% of all CHI 2015 accepted submissions across all tracks can be categorized as focused on older adults). This workshop aims to raise awareness of the challenges and research opportunities in this field.

Workshops Themes

As the proposed inaugural CHI workshop on Designing Mobile Interactions for the Ageing Populations, we are suggesting several relevant themes for guiding the participants' position papers and discussions during the workshop.

Current Issues
This topic will focus on discussing issues related to human factors, perception, memory, and motor movement of older adults, and how these issues affect senior-based mobile interface design.

Models and Design
This topic will focus on discussing the state-of-the-art models and design principles for mobile interfaces of older adults. For example, as current mobile interfaces tend to follow a "one design for all" approach, the model parameters can be further tuned to cover individual differences among aged people and ability-based design and optimization principles can be implemented to find the effective senior-based mobile interface design [14].

Evaluation Methodologies
Evaluating senior-based user interfaces still face many challenges, particularly in accurately understanding the preferences, habits, and adoption challenges of older adults [16]. This topic will focus on discussing the state-of-the-art evaluation methods, to discuss how suitable is the current methods to judge the efficacy of the mobile interface design, and identify future research opportunities.

Applications
This topic will discuss what some potentially useful applications for older adults are. For examples, text-entry methods can enhance the usability of messaging

applications. Games and social applications [11] have the potential to improve the wellbeing of older adults.

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